The main advantages of the present invention are:

1. It provides a process of fabricating RE doped preforms and optical fibres by using RE coated silica nanoparticles as precursors. The RE (Er, Nd, Eu etc.) coated silica nanoparticles are prepared by sonochemical method.
2. The deposition of a porous soot layer at high temperature (1000°C or above) by CVD process inside a fused silica glass tube or on a seed rod (VAD or OVD apparatus) is eliminated for formation of the core. Instead a thin silica gel coating containing other dopants in desired proportions is applied through a silica sol at ambient temperature.
3. The method described in 2 above ensures a better control of the characteristics of the coated layer like porosity, thickness etc. and uniformity along the length of the tube.
4. The difficulties and uncertainties involved in incorporation of the rare-earth ions in desired concentration into the porous soot layer by the solution-doping technique and such other methods are eliminated.
5. The rare-earth oxide coated silica nanoparticles are dispersed at ambient temperature in the silica sol mentioned above under sonication thereby eliminating the possibility of formation of the microcrystallites and clusters of rare-earth ions as in the conventional techniques.
6. The possibility of evaporation of RE salts at high temperatures is considerably eliminated due to the direct addition of RE oxides which prevents change in composition including variation of RE concentration in the core and also reduces the possibility of formation of RE dip at the core centre.
7. The process ensures better control of RE concentration in the doped region and homogeneous distribution of RE ions along the radial direction as well as throughout the length of the preform.
8. The RE incorporation efficiency is much higher compared to the conventional techniques due to direct addition of the RE oxides in to the dispersion.
9. The numerical aperture of the fibre is varied from 0.10 to 0.30 maintaining RE concentration in the core between 50 to 4000 ppm to produce fibres suitable for application as amplifiers, fibre lasers and sensors or different purposes.

10. The addition of $Ge(OET)_4$ at ambient temperature in the silica sol above reduces the quantity of $GeCl_4$ which is required at high temperature to achieve the desired NA.
11. The time period of processing the silica tube at high temperature and the number of steps involved for doping of RE ions by the conventional techniques for fabrication of the preform are considerably reduced.
12. The processing of the tube at ambient temperature before sintering and collapsing instead of high temperature involved in the CVD process makes the process less sensitive to the process parameters unlike the conventional processes.
13. The advantages described above increases the reproducibilty and reliability of the process to a great extent.
14. The requirement of precision equipments for control of porous soot deposition, RE incorporation etc. during fabrication of the preform is considerably eliminated which will reduce the capital investment and cost of the product.
15. All the above advantages combined make the process simple and more economic than the conventional processes.